



U.S. EPA Contaminated Site Cleanup Information (CLU-IN)

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DCE STALL TOOL U.S.

Navy, Naval Facilities Engineering Command, Environmental Restoration Technology Transfer, Multimedia Training Tools website.

The reductive dechlorination of perchloroethene (PCE) and trichloroethene (TCE) yields dichloroethene (DCE), vinyl chloride (VC), and ethene. When the reductive dechlorination process is incomplete, the levels of DCE and VC in ground water can build up over time. This process is referred to as DCE stall, and it can limit the ability to meet cleanup goals and obtain site closure. This training tool discusses the suspected causes of DCE stall, along with potential solutions for this problem. DCE stall is typically caused by insufficient electron donor to achieve strongly reducing conditions. Under

less reducing conditions, the DCE concentrations in ground water may accumulate without the apparent accumulation of VC, ethene, or ethane. At these sites, biological activity can be hindered by lack of sufficient electron donor or affected by pH, the presence of biotoxins, micronutrient limitations, and other factors. It also is possible that the expected products of VC and ethene are not formed because microbial oxidation or abiotic pathways are dominant (e.g., DCE transformation directly to carbon dioxide). All of these factors should be carefully considered before exploring a biostimulation or bioaugmentation approach at a given site. Practical limitations to the effectiveness of bioaugmentation include the survivability and distribution of introduced microbes within the subsurface. Though the use of bioaugmentation has been demonstrated at the laboratory scale and with small-scale field projects, it has not been demonstrated to be effective at the full scale. Available at <http://www.ert2.org/ert2portal/>

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